

### **REMARKS/ARGUMENTS**

#### **I. General Remarks**

Please consider the application in view of the following remarks.

#### **II. Disposition of Claims**

Claims 1-4, 8-14, 17, 18, 22-33, and 35-45 are pending in this application. Applicants have amended claims 1, 8, 10, 11, 13, 14, 32, and 37 and have added new claims 46 and 47. Claims ~~2~~<sup>2</sup>-7, 15-16, 19-31, 33-36, 38-45 are canceled, including the previously withdrawn claims.

#### **III. Information Disclosure Statement**

The Examiner has noted that the information disclosure statement filed on January 13, 2006 does not have any apparent relation to the subject matter of the instant disclosure. The Examiner is correct. The information disclosure statement was filed in error, having been intended for a different patent application. Applicants regret the inadvertent error and the inconvenience caused the Examiner. The information disclosure statement should be considered withdrawn.

#### **IV. Claim Objections**

The Examiner has objected to claim 10 as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Examiner has stated that, "Claim 10 recites taking at least one core sample from the region of said formation, which is inherent to the parent claim, since the parent claim recites analyzing the formation, which inherently requires taking the sample for analysis."

Applicants respectfully traverse the Examiner's rejection. Applicants teach in their specification, for example paragraphs 25 and 27, that analysis of the formation can be conducted by taking core samples from the formation for analysis, by conducting testing or logging of the

formation with an NMR wireline tool in the borehole, or both. Thus, Applicants respectfully submit that formation analysis does not require core sampling and thus the step of analyzing the formation does not inherently require the taking of core samples for analysis.

**V. Claim Rejections—35 U.S.C. § 112**

The Examiner has rejected claims 1-4, 8-14, 17-18, 32, 33, and 35-38 under 35 U.S.C. § 112, first paragraph, quoting claim 1 and then comparing it to paragraph [0007] of the specification. This rejection is not understood, as paragraph [0007] is from the *background* section of the patent application, and does not describe the invention. Rather, paragraph [0007] is directed to the problem which the invention solves.

The Examiner then indicates that in her view the examples are “irrelevant” to the invention since they are directed to “expected broadening of NMR spectral lines for a pure synthetic oil-based drilling fluid upon adding paramagnetic species, with the broadening proportional to the concentration of the paramagnetic species.” The Examiner says that the examples are “not related to the ‘*method of distinguishing oil based drilling fluid from subterranean formation fluid hydrocarbons during nuclear magnetic resonance testing while drilling a borehole in the subterranean formation, said method comprising adding paramagnetic species to the drilling fluid and circulating the drilling fluid containing the paramagnetic species in the borehole prior to said testing, wherein the testing comprises logging the borehole and taking nuclear magnetic resonance measurements of the subterranean formation during the logging.*’” (italics in the office action).

The Examiner continues, quoting paragraphs [0009] and [0021] and then alleging that the “specification is silent regarding ‘a method of detecting hydrocarbon-bearing zones in a formation penetrated by a borehole’ as recited in claims 8-10, ‘a method of detecting or

identifying characteristics of hydrocarbons in the formation surrounding a borehole drilled with oil-based drilling fluid' as claimed in claims 11-13, 'a process of analyzing the fluid composition of a subterranean formation' as claimed in claims 14-18, or 'a method of drilling a borehole in a subterranean formation' as claimed in claims 32-33, 35-37." The Examiner then adds that the scope of claims 32-33 and 35-37 is not supported by the scope of the specification.

Applicants respectfully traverse these rejections and respectfully submit that it is error for the Examiner to select a few paragraphs from the specification for her rejections when the law requires that the specification be read in its entirety. Applicants respectfully submit that one of ordinary skill in the art, reading the specification in its entirety, would well understand the invention and find the claims to be fully supported by the disclosure. Nevertheless, Applicants have further amended the claims for the Examiner's consideration herewith.

Applicants appreciate that the Examiner has a "PhD specifically in NMR spectroscopy and has over 20 years experience of working in some leading NMR laboratories of the country" and that she further "has several publications in peer-reviewed journals related to NMR studies involving paramagnetic lanthanide shift reagents." Applicants and their counsel did not intend to appear to be disrespectful when their counsel commented in response to the previous office action that the Examiner was not skilled in the art of the present invention. However, it was and remains apparent to Applicants that they/their counsel and the Examiner are not understanding one another and that the Examiner is not appreciating or understanding the invention, because she is not seeing it through the eyes of one of ordinary skill in the art. Applicants' counsel in turn has great difficulty understanding the Examiner's rejections.

Applicants appreciate that the Examiner may be highly skilled, even super skilled in NMR. However, again, Applicants respectfully submit that the Examiner's superior and

outstanding skills, training and experience in NMR do not make the Examiner one of ordinary skill in the art of the invention. The invention is about finding oil; it is not about the world of laboratory NMR spectroscopy. The invention is related to the oilfield, and is directed to the drilling for oil. The industry of the invention, and the use of NMR in the oilfield, is very different from the Examiner's experience in the leading NMR laboratories of the country. The NMRs with which the Examiner is familiar in working in leading NMR laboratories are far more sophisticated and powerful than the NMRs used in oilfield analysis. They are really not used in the same way and Applicants respectfully submit that the Examiner would not even recognize an NMR used in the oilfield as an "NMR" when compared to the ones with which the Examiner is so very familiar. To help the Examiner understand, Applicants advise that the NMRs that would typically be used in Applicants' invention are 1 hertz units.

The Examiner queried Applicants' counsel as to what the counsel meant in saying that one of ordinary skill in the art would understand, and asked if counsel was meaning that the invention was known or obvious. Applicants' counsel was not stating that the invention was obvious or known. Rather Applicants' counsel was trying to communicate what she thought the Examiner did not understand, that is, how drilling and well logging were generally conducted, which would be understood by one of ordinary skill in the art. But it is possible that Applicants' counsel misunderstood the Examiner altogether and thus responded in a manner that the Examiner misunderstood altogether.

Applicants' counsel believes that she may have inquired of the Examiner a number of months ago about an interview and that the Examiner discouraged it at the time, but Applicants' counsel may be mistaken. In any event, Applicants' counsel requests an interview and would appreciate the Examiner's advice as to when this might be done at the Examiner's convenience.

Applicants' counsel believe that perhaps an actual conversation might be more productive or might help clarify the misunderstandings that no doubt are apparent from reading the office actions and Applicants' responses.

In the meantime, in a good faith effort to be fully responsive to the Examiner, Applicants respectfully incorporate their response to the previous office action in traversing the Examiner's rejections, in addition to the additional responses provided herein. Further, Applicants respectfully submit that the Examiner's rejections are mooted by the amended claims.

#### **VI. Claim Rejections—35 U.S.C. § 102/103**

The Examiner has rejected claims 1-4, 8-14, 17-18, 32, 33, and 35-38 under 35 U.S.C. § 102(b) as anticipated by or under 35 U.S.C. § 103 as obvious from Kleinberg (U.S. 6,346,813). Applicants respectfully traverse these rejections for the reasons stated in response to the previous office action and for the further reasons set forth herein.

Applicants respectfully submit that Kleinberg does not teach the paramagnetic species that Applicants teach and that Kleinberg does not enable Applicants' invention. Kleinberg teaches that:

Dissolved paramagnetic compounds will reduce the proton relaxation times of oils. Thus if two oils have the same viscosity, they will have different relaxation times if they have substantially different paramagnetic content. While many crude oils and most oil base mud filtrates have negligible magnetic content, some crude oils have significant amounts of vanadium or nickel [Tissot and Welte, "Petroleum Formation and Occurrence", Springer-Verlag, 1978, Figure IV.1.20]. Because the relaxation effect is proportional to paramagnetic concentration, the proportions of two oils in a mixture can be monitored. Deliberate introduction of an oil-soluble paramagnetic substance into the oil base mud can considerably enhance this effect when the native crude is relatively free of paramagnetic material.

Kleinberg, Col. 8, lines 5-18.

Applicants teach the specific paramagnetic species that will enable identification of a shift in the NMR response that distinguishes the drilling fluid from formation hydrocarbons.

Preferably an amount of the paramagnetic species is used so that a quantitative determination of any drilling fluid that filters into the formation may be made as well as detection of the drilling fluid of the formation. However, even addition of a small amount of oil soluble or oil solubilized paramagnetic species to oil-based drilling fluid causes the detectable and identifiable shift. Paragraph [0022] of Applicants' specification.

Applicants' invention affords or enables detection of or distinguishing of drilling fluid from formation fluids when the drilling fluid and the formation fluids have different viscosities, as well as the same viscosity.

While there is mixing between the formation fluids and the drilling fluid, there is not an equilibrium in the subterranean formation during drilling and the drilling fluid is not infinitely diluted in the formation fluid. Rather, there are regions of drilling fluid and regions of formation fluids—of pure native or residual hydrocarbons, i.e., formation oil. Under these circumstances, the shifting of the NMR response—the moving of where the peak comes out—is far more important in distinguishing the drilling fluid from the formation fluids than is the more or less broadening of the lines or peaks as seen with Kleinberg.

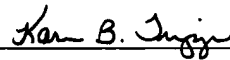
The Examiner has advised that she expects a “comparative analysis of the claimed subject matter of the instant invention vs. the disclosure” of Kleinberg, “with specific indication of distinctions between these disclosures.” Applicants object that it is improper for the Examiner to order such unduly burdensome and costly testing and comparative data from the Applicants. Moreover, Applicants would have to use the benefit of their own invention to make this comparative analysis, which would be improper use of hindsight.

**SUMMARY**

Applicants respectfully submit that the claims as amended are now in condition for allowance and Applicants respectfully request the Examiner to allow the application to proceed to issue.

Respectfully submitted,

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